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expected from untried crosses, and has shown itself to be invaluable in everyday work. Detlefsen's own account is in agreement with this, for he says that his stock of white miniature has been used in class work and has always given the value to be expected from the published maps. When values that do not agree with the "normal" map are found, analysis has always shown some disturbing factor to be present; and in all cases where the point has been investigated it has been found that maps based on data uniform with respect to this disturbing factor are entirely self-consistent.

In view of these considerations it is clear that Detlefsen has misunderstood the significance of the published maps. The conception that he has attacked is one that has not been held or urged by those who have constructed chromosome maps.

[1] Detlefsen, J. A., These PROCEEDINGS, **6,** 1920 (663–670).

[2] Sturtevant, A H., *J. Exper. Zoöl.,* **14,** 1913 (43–59).

[3] Sturtevant, A. H., *Zs. ind. Abst. Vererb. Lehre,* **13,** 1015 (234–287).

[4] Morgan, T. H., A. H. Sturtevant, H. J. Muller, and C. B. Bridges, New York, 1915, 262 pp.

[5] Bridges, C. B., *J. Exper. Zoöl.,* **19,** 1915 (1–21).

[6] Sturtevant, A. H., These PROCEEDINGS, **3,** 1917 (555–558), and *Carnegie Inst. Washington Publ.,* No. 278, 1919 (305–341); Muller, H. J., These PROCEEDINGS, **3,** 1917 (619–626), and *Genetics,* **3,** 1918 (422–499); etc.

[7] Morgan, T. H., *The physical basis of heredity,* Philadelphia, 1919, 305 pp.

ORIGIN AND HISTORY OF THE BEAR FAMILY IN THE WESTERN HEMISPHERE, WITH PARTICULAR REFERENCE TO THE RELATION OF THIS QUESTION TO PROBLEMS OF GEOGRAPHICAL HISTORY

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Although bears of many varieties are widely distributed in America and have been present in large numbers for a very long period measured in terms of years, the history of this group shows that as we go back in the geological record no evidence of representatives of the bear type are present in formations of the third geological period preceding the present in America, while they are known in considerable numbers in the rocks of this age found in the Old World. There is, therefore, good reason to believe that the bear group is derived from the other side of the earth and that the ancestors of the present American bears migrated to this continent at a time geologically not far removed from the present.

The bears of the world may be divided into two large groups, one some-times known as the true bears, including the brown and grizzly types now widely distributed over the whole northern hemisphere. The second group is represented by the spectacle bear and is limited to the Andean region of South America.

In the geological period known as the Pleistocene, immediately preceding the present, true bears like the present black bear type were associated in North America with a group of large bears known as Arctotheres, closely related to the present spectacle bear of South America. In the same period South America was inhabited by numerous Arctotheres but contained no representatives of the true bears.

In the rocks of the Pliocene, or second geological period preceding the present, until recently no representatives of the bear group have been known in either North or South America. In the Pliocene deposits of Europe and Asia there are, however, remains of creatures closely related to the true bears and with these a second group originally known as the hyena bears, or the Hyaenarctos type, closely related in many characters to the Arctotheres, and through them related to the modern South American spectacle bears.

Assuming that the American bears are descendants of the Old World types, it is difficult to escape the conclusion that wide land connections existed between North America and Asia, and between North and South America, at such times as to permit the migration suggested by the present distribution. As the Arctotheres are represented in the Pleistocene of South America without accompanying true bears, it is logical to assume that the Arctothere group was the first to migrate to America and that it passed through North America reaching the South American region before the true bears had spread over North America. Investigations within the last few years have shown that in the Pleistocene deposits of North America both Arctotheres and true bears are present together down to the earliest strata in which remains of bears have been discovered. There has, therefore, been reason to assume that remains of Arctothere-like bears would be found in the Pliocene of America without associated remains of the true bear type. The point of the present paper is to call attention to the fact that recent carefully conducted investigations in the Pliocence deposits in several parts of North America have brought to light remains of bear-like forms which are intermediate between the typical hyena bears of the old world Pliocene and the Arctotheres of the American Pleistocene. Such a form is represented by a specimen found in the Pliocene of Oregon. This animal corresponds very closely to the most specialized of the hyena bears of India and also approaches the Arctotheres in its structure.

The evidence now available indicates that creatures of the hyena bear type came by way of broad land connections from Asia to North America in Pliocene time; that these creatures represent the type of hyena bear most nearly approaching the Arctotheres and were widely distributed in North America. There is reason to believe that from this group the Arctotheres may have developed within the American region, and that the Arctotheres by way of a wide land bridge came to people South America.

The present spectacle bears of South America seem then to represent the last remnant of a group which originated in the Old World, was once widely distributed over the world, and included the largest of all known bears.

AN UNIDENTIFIED BASE AMONG THE HYDROLYTIC PRODUCTS OF GELATIN

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Of the known amino acids yielded by acid hydrolysis of proteins the work of various authors[1] has indicated that four, viz., histidine, arginine, lysine, and cystine, are distinguished from the others by the relative insolubility of their phosphotungstates in acid solution. On the basis of this fact Van Slyke[1] devised a method for separating these four amino acids as phosphotungstates, and determining them by utilizing certain characteristics of their chemical structure. The non-amino nitrogen of this group of amino acids is entirely in the histidine and arginine. The arginine was determined directly, and the histidine was estimated on the assumption that all the remaining non-amino nitrogen was in histidine.

This assumption we have tested by comparing the histidine content of a number of proteins as determined in the above manner with the values determined by Koessler and Hanke's direct colorimetric method.[2] In casein, edestin, and fibrin, the results by the two methods agree. But in gelatin the calculation based on the non-amino nitrogen indicates 6.1 per cent of the total protein nitrogen in the form of histidine, while the colorimetric method shows only 1.8 per cent. There is evidently among the products of gelatin hydrolyzed by hydrochloric acid a substance, or substances, hitherto unrecognized, precipitated with phosphotungstic acid under the conditions ordinarily utilized to precipitate the hexone bases.

In attempting to isolate the substance we have precipitated it by means of phosphotungstic acid with the other bases, have redissolved the precipitate and freed it from phosphotungstic acid. The histidine and arginine were removed by precipitation with silver sulfate and barium hy-